



**Research Article**

## **MALNUTRITION: A CAUSE OF DECREASE IQ LEVEL**

**Shahameen Aqeel<sup>1</sup>, Arifa Savanur<sup>1</sup> and Areeba Aqeel<sup>2</sup>**

<sup>1</sup>Neuromuscular Research Unit, Department of Physiology, University of Karachi

<sup>2</sup>FCPS Trainee, General Surgery, Abbassi Shaheed Hospital, Karachi

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### **ABSTRACT**

The main growth and development of brain in children occurs before the age of 5 yrs. About 80% of brain development occurs at 2 yrs. Before the age of five, deficiency of different nutrients in diet may lead to malnutrition which result in many diseases i.e anemia, rickets, marasmus, and other nutritional deficiency disorders. Malnourished children are also immunodeficient and are vulnerable to many infectious diseases.

There are different nutrients which are involved in decrease body function but some are most important whose deficiency can cause irreversible damage from first to yrs to adolescent i.e Proteins, Iodine and Iron.

Recent reports revealed that Docosahexaenoic acid (DHA) and Omega 3 are also the essential nutrients for neuronal development, maturity and proper functioning of cerebral cortex and hippocampus. So children who are deficient in these nutrients face difficulty to understand things which normal children of their age pick easily, thus the kids show poor IQ level.

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### **INTRODUCTION**

Malnutrition means inadequate food intake or food taken into diet doesn't produce enough amount of energy that required by body for normal functioning. Due to malnutrition body can not fight with infectious agents, as proper amount of protein not present in diet and lead to decrease in muscular power. Absence or decrease in essential micro nutrient in diet like different vitamins and minerals leads to retard brain development(1,2).

Most important whose deficiency can cause impaired cognitive and intellectual functions and irreversible damage to brain from first two years to adolescent are protein, Iron, Zinc and Iodine but selenium, calcium and fluorine are also important for brain development (1, 3, 4, 11). These biologic compounds are involved in the formation of new synaptic connections between different nerve cells which grows with age and improve cognitive functions. Metals are involve in regulation of cognitive process. Deficiency of iron leads to learning difficulty especially in order to understand maths(5). Iron causes alteration in different neurotransmitter synthesis like monoamine neurotransmitter system, altered myelination of neurons especially in hippocampus, thus impaired memory and also iron deficiency in basal ganglia causes impaired cognitive functions (6,7,8).

Zinc effects on autonomic nervous system and also produce effects on visual cortex, prefrontal cortex and hippocampus not only in post natal life but also during gestational period (9, 10). Copper mainly effects on cerebellum so involve in balance and fine intellectual functions.(12, 13). Different vitamins like A, B1, B6, B12, C, D, E helpful in improving in intelligence, because these vitamins improves transport of glucose across brain thus enhances IQ level (12). Protein calorie malnutrition or protein energy malnutrition (PEM) have wide spread effect on different areas of brain especially hippocampus and cortex so effect the intellectual functions and memory. IQ level is inversely proportional to the malnutrition. It not only stunting the growth of the children but some may develop mental retardation because of poor neuronal circuit development which lead to decrease synapse formation result in damage to nerve cells (14, 15).

Long chain polyunsaturated fatty acid especially DHA and omega 3 causes formation of new synapses, myelination, improves visual acuity and maintain membrane potentials (16,17). From different previous studies it is suggested that DHA and omega 3 not only involve in intelligence but its deficiency leads to depression, mood swings, altered behavior, attention deficit and aggression (19).

According to recent research the effects is some what different in male and female for example, in malnourished boys there cognitive deficit of verbal and audiovisual recall but in

*\*Corresponding author: Shahameen Aqeel*

Neuromuscular Research Unit, Department of Physiology,  
University of Karachi

malnourished girls the deficit is only found for picture recall (14).

## CONCLUSION

Malnutrition not only cause cognitive and intellectual deficit in childhood but in long term it result in attention deficit and hyperactive disorder (18). They also show poor school performance, antisocial and aggressive behavior (19). In addition to decrease IQ level in childhood, there is other nutritional disorders like angular stomatitis, glossitis, night blindness, dementia, diarrhea and mineral deficiency were also observe (12). Oral symptoms first to appear in vitamins and mineral deficiency (20).

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